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EXAMINER

PALABRICA, RICARDO J

| ART UNIT | PAPER NUMBER |
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3663

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,512

Applicant(s)

TALEYARKHAN, RUSI P.

Examiner

Rick Palabrica

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) 3-9, 11-13, 15 and 23-75 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10, 14 and 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/31/02.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

1. Applicant's election with traverse of Group I (Apparatus), burst generator with a liquid under tension, centrifugal source for placing the liquid under tension, fundamental particles for the structure for cavitating, and acetone for the liquid, in the reply filed on 9/25/06, is acknowledged.

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP §818.03(a)).

The restriction requirement is still deemed proper and is therefore made **FINAL**.

2. Applicant alleges that claims 1, 2, 8-10, 14 and 16-22 read on the elected invention. The examiner disagrees.

The claims recite four (4) distinct species of the structure for placing a liquid under tension; namely, centrifugal source (e.g., claim 2), acoustic wave source (e.g., claim 3), magnetostrictive source (e.g., claim 6) and electrostrictive source (e.g., claim 7). Applicant has elected for examination a centrifugal source. Claims 8 and 9 are directed to the non-elected acoustic wave source.

Accordingly, only claims 1, 2, 10, 14, and 16-22, which are directed to the elected invention, are examined in this Office action.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the source of

fundamental particles, controller, and structure for condensing vapor into liquid state must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are also objected to because lines defining the elements and their interrelationships are not well defined (e.g., see Figs. 1 and 4), some elements are not numbered (e.g., see Fig. 6). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure.

The elected invention is directed to an apparatus that places a liquid in a tension state and cavitating the liquid with nuclear particles that include alpha emitters, neutron sources and fission fragments (e.g., see claims 1 and 10). Such cavitation process result in nuclear fusion reactions, as per the following applicant's statements in the specification:

"Nuclear energetics, such as initiation of nuclear fusion reactions, can result from the cavitation process and increase the above energy level values by a factor of up to 10.sup.6. For example, implosive dynamics producible by the invention could be robust enough to lead to nuclear fusion. If so, deuterium-deuterium (D-D) or deuterium-tritium (D-T) nuclear reactions can take place. The energy density of release from D-D or D-T reactions is close to 10.sup.6 times greater than that available from conventional chemical explosives" See paragraph bridging pages 21 and 22..

Ionizing particle techniques utilize fundamental particles, such as neutrons, alpha particles or fission fragments. These particles have been demonstrated to be able to interact with individual nuclei of the target liquid atoms to permit nanosecond timed initiation of explosive vaporization. This invention can also utilize a variety of nucleating agents, such as dissolved alpha emitters, dissolved fissioning nuclei and the use of externally generated neutrons from small hand-held isotopic sources (such as californium or Pu--Be) or using pulsed neutron sources that are based on D-D and D-T reactions and produce 4 Mev and 14 Mev neutrons, respectively. Such sources of nucleating agents are readily available for safe use (with appropriate shielding). See paragraph bridging pages 30 and 31.

There is no reputable evidence of record to support any allegations or claims that the invention is capable of operating as indicated in the specification, that any allegations or claims of imploding a bubble that results in temperature sufficient to induce nuclear fusion reaction in a liquid or its vapor.

The invention is directed to the process of producing nuclear fusion utilizing a cavitation nuclear reactor. The alleged nuclear fusion reactions are caused by the formation and collapse of bubbles by acoustic energy in a liquid. This formation and collapse of bubbles by acoustic energy is more commonly known as "sonoluminescence", "sonofusion", "acoustic inertial confinement fusion", or "sonochemistry".

The concept of sonoluminescence is nothing new to the scientific community. Sonoluminescence was discovered in the early 1930's by German scientists trying to speed up the photography development process. The scientists noticed that by vibrating the photo development fluid at frequencies higher than the human ear could hear a faint glow was emitted. Upon further inspection of the film plates the scientists discovered spotting on the development plates caused by the light generated as a result of the induced frequency in the development fluid. See Wilson, "Hot Sounds", Popular Mechanics, 2/1998.

It was not until the early 1990's that sonoluminescence again surfaced in the scientific community. Scientists such as Seth Putterman and William C. Moss have stated their belief that the light generated during sonoluminescence is in the ultraviolet portion of the light spectrum. Ultraviolet light corresponds to a photon energy level of

six electron volts, which is equivalent to a temperature of 72,000 °K, or 130,000 °F. Such temperatures are below the 4,000,000 °F necessary to achieve nuclear fusion. However, both Putterman and Moss believe that sonoluminescence is a viable vehicle for nuclear fusion. See for instance, Putterman, "Sonoluminescence: Sound into Light" Scientific American, 2/1995; Putterman et al (5,659,173); and Moss et al, "Hydrodynamic Situations of Bubble Collapse and Picosecond Sonoluminescence", Phys. Fluids, Vol. 6, No. 9, 9/1994.

The allegation or claim of nuclear reactions and associated reaction products from a forced bubble fusion reactor is questioned. Note Browne, The New York Times, 12/1994 and "Star in a Jar", Popular Science, 12/1998.

While applicant theorizes that his cavitation system according to the claimed invention can initiate nuclear fusion reactions (e.g. see above citations from the specification) there is no reputable evidence of record showing that the alleged evidence of nuclear fusion, e.g., generation of tritium and/or neutrons could not actually be the result of non-nuclear (e.g., chemical) reactions or some other unknown phenomenon. Accordingly, the cavitation method for inducing nuclear reactions by bubble generation and subsequent implosion referred to in applicants specification (see page 1+), must be the result of a variation of cold nuclear fusion reactions. This statement is based on the fact that no indication, other than speculation, of the actual temperatures needed to achieve the nuclear reaction or the alleged generation of neutrons or tritium are provided by applicant.

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Doubts have been raised by the scientific community on the generation of nuclear fusion by collapse of cavitation bubble (also referred to as "sonofusion", "acoustic ICF", "sonoluminescence", etc.). Some examples are given below.

L.Crum, in his paper, "Sonoluminescence and Acoustic Inertial Confinement Fusion" presented at the "Fifth International Symposium on Cavitation," Osaka, Japan, Nov. 1-4, 2003, reports the following issues:

- The temperature required for significant D-D fusion is in the order of 100 million degrees. Temperature within a sonoluminescing bubble did not exceed a few tens of thousands of degrees. See page 1, col. 2, 2nd paragraph).
- Seth Putterman, proponent for Acoustic ICF, reports he has been unsuccessful in detecting any neutrons that were coincident with sonoluminescence during cavitation collapse. See page 2, col. 1, 3rd full paragraph).
- Ken Suslick, University of Illinois, noted that atomic and molecular dissociation and ionization were difficult barriers to breach because they required lots of energy, indication that several liquids would not be suitable for generating acoustic ICF. He further indicated that the role of vapor in preventing the heating of fusion plasma must be carefully considered. Based on his own data using a variety of molecular liquids, he suggested that temperatures of only 7,000-10,000degrees are much more likely, contrary to the claims of temperature in the millions of degrees. See page 2, col. 2, 2nd paragraph.
- D. Shapira and M. Saltmarsh, Oak Ridge National Laboratory, failed to reproduce the results of Taleyarkhan experiment to produce thermonuclear fusion from cavitating bubbles. The duo, using a different neutron-gamma detection system found that the excess neutrons they detected with cavitation on (versus cavitation off) were lower than one would expect from the reported tritium data by Taleyarkhan. Shapira pointed out that the "excess" neutrons attributed by Taleyarkhan to acoustic ICF probably came from the pulsed neutron generator used in the Taleyarkhan experiment. See page 3, col. 1, 2nd paragraph.

I. Sample, "The Guardian", March 2004, reports in the article, "Science runs into trouble with bubbles" that:

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- Reviewers of Taleyarkhan's paper on his experiment dismissed the claim of tritium production on the ground that his laboratory was probably contaminated by that element.
- In June 2003, Taleyarkhan took the results of this experiment on sonofusion to a government meeting in Arlington to share them with other scientists in the field but succeeded only in reigniting the controversy. He showed, once again, that he had created a star in a jar.

Gordon Pusch (<http://www.physics-talk.com/Why-is-acetone-used-in-sonofusion-experiments-6987552.html>) writes the following observations:

- On the issue of how Taleyarkhan would infer that his apparatus is generating millions of K, Pusch indicates that critics of the "hydrodynamic" computer model of the bubble implosion argue that the model neglects the physical limitations imposed by molecular dynamics degrees of freedom.
- As to the tritium detected in the chamber, Pusch thinks that it might have been produced by neutron capture on deuterium, since the chamber was "degassed" by acoustically cavitating it under neutron bombardment for approx. 2 hours before experimental runs were performed.

Akiro Takahashi, Osaka University (<http://wwwcf.elc.iwate-u.ac.jp/jcf/mlist/00042.html>) provides the following information:

- Culham in Oxford, England, has scrapped its own research into sonoluminescence and other low-tech forms of fusion after a report from Thornton Greenland, a former senior scientist, suggesting it was unlikely to work.

The Chemistry and Industry News (21 April 1997) reports that Andrea Prosperetti, Johns Hopkins University suggests/comments that:

- Sonoluminescence results from a tiny jet of liquid that shoots across the inside of the bubble, and because of the complex interplay between the buoyancy of the bubble and the sound field, the fluid is forced to push out a finger of water from the bubble's surface, i.e., "hammer of water."
- Bubble temperatures in sonoluminescence would peak at 10,000 °F, which is enough to explain chemical activity, but far below the amount needed to produce nuclear fusion.

Nuclear News, in its September 2002 article, "Chemistry casts doubt on bubble fusion", has the following statement:

- Scientists at the University of Illinois at Urbana-Champaign (UIUC) have determined that fusion is unlikely to occur in volatile liquids such as water or acetone, which was used in the original bubble experiment.

(Examiner's note: Applicant's claimed invention uses acetone as working liquid, e.g., see claim 14)

B. Naranjo (arXiv.org>physics>physics/0603060), who commented on Taleyarkhan et al.'s 96 034301(2006) communication to the Phys.Rev.Lett., has the following statement:

- "In a recent Letter [1], Taleyarkhan and coauthors claim to observe DD fusion produced by acoustic cavitation. Among other evidence, they provide a proton recoil spectrum that they interpret as arising from 2.45 MeV DD fusion neutrons. My analysis concludes the spectrum is inconsistent with 2.45 MeV neutrons, cosmic background, or a $^{239}\text{PuBe}$ source, but is consistent with ^{252}Cf source." Underlining provided.

(Examiner's note: Applicant uses californium as source of neutrons for a nucleating agent. See above citation from the specification.)

Applicant's invention is considered to be nothing more than a variation of the "cold fusion" system/concept set forth by Fleischmann and Pons (see the 3/24/89 article by D. Braaten). Note further, that merely proposing a new or different theory to account for the alleged production of nuclear reaction products does not change such systems into non-cold fusion systems.

As set forth more fully below, this concept of producing nuclear fusion from cavitation of bubbles is still no more than just an unproven concept.

Many laboratories have attempted to confirm nuclear reactions taking place during sonoluminescence. The results of these attempts at confirmation have been primarily negative (see for example, Kaiser, "Inferno in a Bubble Turning sound into light poses a tantalizing puzzle" Science News, Vol. 147, 4/1995).

Even Moss a proponent of nuclear fusion by sonoluminescence admits that the physics is not understood and that careful experimentation is required. It is also a general consensus by those skilled in the art and working at various laboratories that there is no reputable evidence of neutron, gamma ray, tritium or helium production to support the allegation or claim that nuclear reactions are taking place, nor is there any reputable evidence to support the allegation or claim of excess heat production. See for example (see for example, Kaiser and "Star in a Jar", Popular Science, 12/1998).

Moss further asserts that even if nuclear fusion by sonoluminescence is possible it will not be capable of use as an energy source. To quote, "If I were to tile the world with these SL devices, throw all the people off to make more room, and they generated thermonuclear fusion for 1 hour, all the energy put together would be enough to heat a cup of water one degree." See "Star in a Jar", Popular Science, 12/1998.

Applicant's specification contains assumptions and speculation as to how and in what manner, his invention will operate (see specification page 1+). Indeed, applicant appears to be basing the operativeness of his invention on various approximations, estimations, assumptions, etc., of the specification. It can be said that one could manipulate any number of approximations, estimations and assumptions to come up with a result, which would allegedly "work" in theory. However, applicant has presented

no reputable factual evidence to support his assumptions and speculation, that his invention is operative. Without reputable evidence to the contrary, the accepted scientific community theory is presumed correct (i.e., no nuclear reactions are taking place). The disclosure is insufficient in failing to set forth the underlying assumptions for applicant's theory as well as applicant's appraisal of the degree of validity of said assumptions.

The specification appears to implosive dynamics from the claimed invention leading to nuclear reaction products, e.g., tritium (see page 21+) . However, these allegations are not sufficient to overcome the numerous teachings by skilled artisans, (set forth above by the examiner) that the allegations of the obtainment of said nuclear reactions or products in such a system are not reproducible or even obtainable. It is not clear from the information set forth in the specification, that when all possible sources of error are taken into account, that the applicant would still be able to show positive results or that the alleged positive results do not fall within the limits of experimental error or, that the alleged positive results are no more than a misinterpretation of experimental data. For example, since applicant's invention is closely related to or a variation of the concept of "cold fusion" a study in the source of errors in such systems is appropriate and applicable (see for example Browne, Kreysa et al, Lewis et al, Hilts, Horanyi, Ohashi et al, MisKelly et al, Stipp or Chapline).

It is not seen wherein the specification discloses any particular structure, etc., which is unique to applicants' system and which makes applicants system operative

whereas the systems disclosed in the above referenced "numerous teachings by skilled artisans", are not operative.

While applicant may have set forth theoretical concepts, it is well known in the nuclear field that theory and reality have a habit of not coinciding. There is no evidence to indicate applicant has so succeeded where others have failed, in arriving at an operative sonoluminescent system, i.e. that he has progressed his system beyond the point of an unproven theory or concept which still requires an undue amount of experimentation to enable the artisan to make and use the inventive system for its indicated purpose. To reiterate briefly, the examiner has presented evidence, that nuclear reaction and associated reaction products, can reasonably be expected to be reproducible or even obtainable with the present invention.

There is no reputable evidence of record that would overcome the experimental showings in the above listed references, disproving this concept of "sonoluminescence".

Again, there is no evidence to indicate applicant has so succeeded where others have failed, in arriving at an operative system that produces nuclear reactions by sonoluminescence, i.e., that he has progressed his system beyond the point of an unproven theory of concept which still requires an undue amount of experimentation to enable the artisan to make and use the invention for its indicated purpose.

There is neither an adequate description not enabling disclosure of the parameters of a specific operative embodiment of the invention, including the exact composition (including the impurities and amounts thereof) of the acetone, the operating pressure and spin rate for acetone, amount of dissolved gases in the acetone, specific

geometry and surface conditions of the structures surrounding the acetone, etc. Impurities can have an adverse effect on the desired operation of the invention, as applicant himself admits that impurities can make a liquid unsuitable for the invention (e.g., see page 19+).

It is thus considered that the examiner (for the reasons set forth above) has set forth a reasonable and sufficient basis for challenging the adequacy of the disclosure. The statute requires the applicant itself to inform, not to direct others to find out for themselves; In re Gardner et al, 166 U.S.P.Q. 138, In re Scarbrough, 182 U.S.P.Q. 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art; In re Hirsch, 131 U.S.P.Q. 198.

5. The disclosure is objected to because of the following informalities: It is unclear as to what status the applicant wants to attribute to the references at the end of the disclosure, e.g., do they represent prior art? Appropriate clarification is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1, 2, 10, 14, and 16-22 are rejected under 35 U.S.C. 101 because the claimed invention as disclosed is inoperative and therefore lacks utility.

The reasons that the inventions as disclosed is inoperative are the same as the reasons set forth in section 4 above as to why the specification is objected to and the reasons set forth in section 4 above are accordingly incorporated herein.

There is no reputable evidence of record to indicate the invention has been reduced to the point of providing in current available form, an operative nuclear system (including one that generates nuclear fusion and reaction products). The invention is not considered as meeting the requirements of 35 U.S.C. 101 as being "useful". Note in this respect, "Star in a Jar", Popular Science, 12/1998 which indicates that there is no convincing evidence that the phenomena attributed to sonoluminescence would produce useful sources of energy.

The applicant, at best, has set forth what may be considered a concept or an object of scientific research. However, it has been held that such does not present a utility within the meaning of 35 U.S.C. 101. See Brenner v. Manson, 148 U.S.P.Q. 689.

Additionally, it is well established that where as here, the utility of the claimed invention is based upon allegations that border on the incredible or allegations that would not be readily accepted by a substantial portion of the scientific community, sufficient substantiating evidence of operability must be submitted by applicant. Note In re Houghton, 167 U.S.P.Q. 687 (CCPA 1970); In re Ferens, 163 U.S.P.Q. 609 (CCPA 1969); Puharich v. Brenner, 162 U.S.P.Q. 136 (CA DC 1969); In re Pottier, 152 U.S.P.Q. 407 (CCPA 1967); In re Ruskin, 148 U.S.P.Q. 221 (CCPA 1966); In re Citron, 139 U.S.P.Q. 516 (CCPA 1963); and In re Novak, 134 U.S.P.Q. 335 (CCPA 1962).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 2, 10, 14, and 16-22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The reasons that the inventions as disclosed are not enabling are the same as the reasons set forth in section 4 above as to why the specification is objected to and the reasons set forth in section 4 above are accordingly incorporated herein.

8. Claims 1, 2, 10, 14, and 16-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, the term "portion" is a relative term that renders the claim indefinite. The term "portion" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Accordingly, the cavitation of the tensioned liquid with nuclear particles is indefinite.

Claim 16 recites the limitation "said energy stored" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation "said vapor" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 10 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Putterman et al. (U.S. 5,659,173) or Flynn (U.S. 4,333,796).

Either one of Putterman et al. or Flynn disclose a burst generator for implosion of a liquid containing hydrogen isotopes, i.e., water (e.g., see Abstract in Putterman or col. 1, lines 20+ in Flynn).

As to the structure for tensioning of the liquid, either one of Putterman et al. or Flynn inherently meets this limitation because they apply acoustic waves to the working liquid that generates pressure and tensions of the liquid.

As to the structure for cavitating the tensioned liquid, either one of Putterman et al. or Flynn inherently meets this limitation because their system includes nuclear particles such as deuterium or tritium that have not interacted with other particles and therefore inherently available for cavitation.

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10. Claims 16-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Putterman et al.

As to claim 17, e.g., see col. 10, lines 44+, on the use of variable inductors.

As to claim 18, e.g., see page 11 and discussion on oscillatory pressure waves.

As to claim 19, there are inherently some vapor condensation in the flask of Putterman et al. The examiner notes that applicant has not defined the degree of condensation, and any condensation of vapor in Putterman et al. reads on the claim limitation.

As to claim 20, applicant's claim language, "controller" reads on the combination of the lock-in amplifier and integrator (see Fig. 23 and co. 18, lines 25+).

As to claim 22, see col. 21, lines 50+, on the discussion of cooling the water.

As to claims 16 and 21, note that the claims are directed to an apparatus and not to a process.

However, the claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, "wherein said energy stored in the tension state is release no more than about 1 μ sec following receipt of cavitation initiation energy from said structure for cavitating (e.g., see claim 16), "wherein said structure for producing a liquid into a tension state produces a time varying tension level in said liquid (e.g., see claim 21), etc. These clauses, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Dally, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The system in the cited reference is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited references.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Putterman et al. or Flynn, in view of Taleyarkhan et al. (IDS Ref. 6). Putterman et al. or Flynn disclose the claim limitations except for the centrifugal source.

Putterman et al. and Flynn have been discussed above.

Taleyarkhan et al. teach a plurality of apparatus for providing tension to liquid water and mercury, including a glass spinner (which generates centrifugal energy) and one that uses an acoustic energy generator (e.g., see paragraph bridging page 4, col. 2 and page 5, col. 1). They teach the glass spinner as being simple but elegant, and does not require direct instrumentation for measuring the cavitation threshold.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either Putterman et al. and Flynn, by the teaching of Taleyarkhan et al., to use centrifugal energy instead of acoustic energy to provide tension to a liquid, to gain the advantages thereof (i.e., elegant simplicity), because such modification is no more than the use of a well known expedient within the nuclear art, and the substitution of one means for placing a liquid under tension by another well known means.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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RJP

November 9, 2006


RICARDO J. PALABRICA
PRIMARY EXAMINER